INPLASY

Fluid resuscitation with severe infection and sepsis: a systematic review and network meta-analysis

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ADMINISTRATIVE INFORMATION

Support - Dazhou center hospital.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024100049

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 October 2024 and was last updated on 11 October 2024.

INTRODUCTION

Review question / Objective The choice of optimal resuscitation fluid for patients with septic shock remains a topic of debate. For adults with sepsis or septic shock, the 2021 Sepsis Survivorship Exercise Guidelines strongly recommend the use of crystalloid as the first-line resuscitation fluid, and balanced crystalloid is weakly recommended. However, two large network meta-analyses in 2020 showed that balanced crystalloid has the most advantages. This study re-evaluated the efficacy and safety of different resuscitation fluids in septic shock by network meta-analysis (NMA).

Condition being studied Fluid resuscitation with severe infection and sepsis.

METHODS

Participant or population Patients with septic shock.

Intervention Balanced solution.

Comparator (Saline), (Iso-Alb), (Hyper-Alb), (L-HES), (HES), (Gelatin).

Study designs to be included Randomized controlled trial.

Eligibility criteria 1. The infection has developed into sepsis;
2. Systemic inflammatory reaction, such as fever, shortness of breath, rapid heart rate, leukocytosis, etc.
3. Obvious signs and symptoms such as altered mental status, edema, positive fluid balance, etc.
4. Organ dysfunction assessment results, such as SOFA score ≥2;
5. Special circumstances, such as qSOFA score.

Information sources PubMed、EMBASE and WOS.

Main outcome(s) Mortality rate.

Quality assessment / Risk of bias analysis The risk of bias of each study was assessed using the Cochrane Collaboration tool.

Strategy of data synthesis Through network meta-analysis, odds ratio was used as the effect analysis statistic for binary data, and mean difference was used as the effect analysis statistic for continuous data, both providing 95% confidence intervals . The outcome indicators of several articles were recorded as median and interquartile range (IQR), and the mean and standard deviation were calculated by calculators according to the sample size . The random effects network meta-analysis model was used to synthesize the effect sizes of the studies . In doing so, the variance of the random-effect distribution (i.e., heterogeneous variance) was taken into account to assess the extent to which treatment effects varied between and within studies. Moreover, in a network meta-analysis, the amount of heterogeneity is first assumed to be the same for all treatment comparisons [14]. Statistical assessment of inconsistency was performed in R (version 4.3.1) using the Rjags package (Martyn Plummer, Coventry, UK), and network plots were drawn to identify comparative relationships between different interventions. The convergence degree of the model was judged by drawing the Brooks-Gelman-Rubin diagnostic map, trajectory map, and density map. The ranking probability map was drawn and the area under the cumulative ranking probability map was calculated to obtain the optimal intervention.The Rjags package was used.

Subgroup analysis Through network meta-analysis, odds ratio was used as the effect analysis statistic for binary data, and mean difference was used as the effect analysis statistic for continuous data, both providing 95% confidence intervals [11]. The outcome indicators of several articles were recorded as median and interquartile range (IQR), and the mean and standard deviation were calculated by calculators according to the sample size [12]. The random effects network meta-analysis model was used to synthesize the effect sizes of the studies [13]. In doing so, the variance of the random-effect distribution (i.e., heterogeneous variance) was taken into account to assess the extent to which treatment effects varied between and within studies. Moreover, in a network meta-analysis, the amount of heterogeneity is first assumed to be the same for all treatment comparisons [14]. Statistical assessment of inconsistency was performed in R (version 4.3.1) using the Rjags package (Martyn Plummer, Coventry, UK), and network plots were drawn to identify comparative relationships between different interventions. The convergence degree of the model was judged by drawing the Brooks-Gelman-Rubin diagnostic map, trajectory map, and density map. The ranking probability map was drawn and the area under the cumulative ranking probability map was calculated to obtain the optimal intervention.

Sensitivity analysis Through network meta-analysis, odds ratio was used as the effect analysis statistic for binary data, and mean difference was used as the effect analysis statistic for continuous data, both providing 95% confidence intervals [11]. The outcome indicators of several articles were recorded as median and interquartile range (IQR), and the mean and standard deviation were calculated by calculators according to the sample size [12]. The random effects network meta-analysis model was used to synthesize the effect sizes of the studies [13]. In doing so, the variance of the random-effect distribution (i.e., heterogeneous variance) was taken into account to assess the extent to which treatment effects varied between and within studies. Moreover, in a network meta-analysis, the amount of heterogeneity is first assumed to be the same for all treatment comparisons [14]. Statistical assessment of inconsistency was performed in R (version 4.3.1) using the Rjags package (Martyn Plummer, Coventry, UK), and network plots were drawn to identify comparative relationships between different interventions. The convergence degree of the model was judged by drawing the Brooks-Gelman-Rubin diagnostic map, trajectory map, and density map. The ranking probability map was drawn and the area under the cumulative ranking probability map was calculated to obtain the optimal intervention.

Country(ies) involved China.

Keywords "Septicemia", "liquid ball", "malaria", "Severe infection".

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